M000051

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2003
OAK RIDGE, TENNESSEE 37831

September 26, 1991

D. R. Allen, Chief
Environmental Operations Branch
DOE Field Office, Oak Ridge
Post Office Box 2001
Oak Ridge, Tennessee 37831-8738

Dear Mr. Allen:

Report Evaluating Areas on Oak Ridge Reservation Open For Hunting

Attached is a copy of the report "Areas Open For Deer Hunting on the Oak Ridge Reservation: Evaluation of Sites for Radiation Contamination and Hunter Safety." Two areas on the Oak Ridge Reservation (ORR) that had previously been open for deer hunting have now been excluded from hunting, because of the potential for low level radiation exposure to the hunter. White Wing Scrap Yard was excluded from hunting in 1989 and 1990, and ER-11 (two radioisotope treatment plots on Chestnut Ridge) was excluded in 1990. W. W. Ogg requested a theoretical evaluation of the impact to a standard-person who might have hunted in these areas. The evaluation is included in the attached report. Based on the calculated average exposure rate, an individual hunting in the White Wing Scrap Yard area could have received 4 mrem whole body dose equivalent, and in the ER-11 area, it could have been 0.2 mrem whole body dose equivalent over a six-day period.

Additionally, all areas on the ORR open for hunting were re-evaluated to determine if there were additional sites with potential contamination risks for hunters. No additional areas were identified.

Sincerely,

M. E. Mitchell

M. E. Mitchell, Director
Environmental Compliance

MEM:JGRogers:jr

Attachment

cc: D. E. Gound, DOE-OR
R. I. Van Hook, Jr.
F. C. Kornegay
B. W. Lu
F. R. Mynatt
R. P. Nicholson, DOE-OR
F. R. O'Donnell
W. W. Ogg, DOE-OR
P. D. Parr
J. G. Rogers
C. L. Stair
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#493

Report to Jim Rogers
Resource Management Organization
June 1991

AREAS OPEN FOR DEER HUNTING ON THE OAK RIDGE RESERVATION: EVALUATION OF SITES FOR RADIATION CONTAMINATION AND HUNTER SAFETY

B. W. Lu[1], P. D. Parr[1], and F. R. O'Donnell[2]
[1]Environmental Sciences Division
[2]Office of Environmental and Health Protection
Oak Ridge National Laboratory

APPROVAL FOR RELEASE

Document: # 18-page rpt dtd 6/91, AREAS OPEN FOR DEER HUNTING ON THE OR RESERVATION: EVALUATION; Date

Title/Subject OF SITES FOR RADIATION CONTAMINATION & HUNTER SAFETY; and 1-page ltr, ME Mitchell to DR Allen (DOE-OR), dtd 9/26/91

Approval for unrestricted release of this document is authorized by the Oak Ridge K-25 Site Classification and Information Control Office, Martin Marietta Energy Systems, Inc., PO Box 2003, Oak Ridge, TN 37831-7307.

Orvin S Trust (RB) 1/29/93

K-25 Classification & Information Control Officer Date

Research sponsored by the Oak Ridge Reservation Resource Management Organization and by the Oak Ridge National Environmental Research Park, Environmental Sciences Division, Ecological Research Division, Office of Health and Environmental Research, U. S. Department of Energy, under contract DE-AC05-84OR21400 with Martin Marietta Energy Systems, Inc.

AREAS OPEN FOR DEER HUNTING ON THE OAK RIDGE RESERVATION: EVALUATION OF SITES FOR RADIATION CONTAMINATION AND HUNTER SAFETY

B. W. Lu[1], P. D. Parr[1], and F. R. O'Donnell[2]
[1]Environmental Sciences Division and
[2]Office of Environmental and Health Protection
Oak Ridge National Laboratory

Areas on the Oak Ridge Reservation (ORR) that are open for public deer hunting were evaluated to: a) determine if any areas open for hunting are radioactively contaminated and should be closed to hunters, b) identify the radionuclides present in any identified contaminated areas, and c) perform dose rate calculations to evaluate impact to individuals who have hunted in identified contaminated areas previously open for hunting.

Public deer hunting began on the ORR in 1985 through an agreement between the Department of Energy (DOE) and the Tennessee Wildlife Resources Agency (TWRA) in an effort to reduce the white-tail deer population and, consequently, the number of deer/vehicle collisions. Prior to initiation of the hunts, best efforts were made to evaluate areas open for hunting to ensure hunter safety and the integrity of DOE facilities during the hunts. During preparations for the November 11-12, 1989 hunt, however, it was discovered that one area previously open for hunting (White Wing Scrap Yard) was radioactively contaminated. The area was immediately roped off and further hunting was prohibited. During 1990 surface radiological investigations were performed (Williams, Rodriguez, and Uziel 1990) and potential radiation doses to hunters were calcuated (memo from F. R. O'Donnell to B. W. Lu dated September 20, 1990). All areas on the ORR open for hunting were re-evaluated to determine if there were any additional sites with potential contamination risks for hunters. ORNL representatives identified only one other area, site ER-11 (2 small, former research plots on Chestnut Ridge). This site was restricted from hunting in 1990 and potential radiation doses were calculated (memo from F. R. O'Donnell to B. W. Lu dated October 5, 1990). No additional areas were identified by K-25 and Y-12 representatives (memo from S. H. Welch to B. W. Lu dated June 6, 1990; memo from J. L. Haymore to B. W. Lu dated June 12, 1990). Copies of these memos are in the Appendix.

White Wing Scrap Yard

Size and Location: This approximately 123,000 square meter (30.4 acres) site is located in the McNew Hollow area on the western edge of East Fork Ridge. It is 1.6 km (1 mile) east of the junction of White Wing Road (Highway 95) and Oak Ridge Turnpike and is contained within the administrative grid coordinates N34,500 to N35,800 and E27,500 to E29,300. Hot Yard Road runs east-west through the site. See Figure 1.

Background Levels: Background gamma exposure rates were measured at uncontaminated outdoor areas on the ORR. Eighteen measurements taken at nine locations ranged from 8-13 uR/h (average 10 uR/h) at 1 m (3.3 ft) and from 10-17 uR/h (average 13 uR/h) at the surface (Williams, Rodriguez, Uziel, 1990).

Contamination Survey and Sample Results: Typical surface radiation levels over the large field areas north and northeast of Hot Yard Road ranged from 10-40 uR/h; south of the road they decreased to 8-30 uR/h. Surface gamma measurements along Hot Yard Road were 6-13 uR/h, typical of background radiation levels. Numerous, small, localized hot spots ranging up to 12,000 uR/h were found, especially north of Hot Yard Road. Results of analysis of soil/concrete/rock/metal samples showed uranium as the dominant radiological contaminant (Williams, Rodriguez, Uziel, 1990).

Dose Calculations: Most of the radioactive contaminants are fixed (not likely to become airborne) in well-defined locations (hot spots). Use of the hot-spot exposure rates in estimating hunter doses is not recommended because the exposure rates fall off rapidly with distance (including height above the ground) from the spot. Ranges of typical ground-surface gamma exposure rates over defined survey grid blocks (100-ft x 100 ft square areas) in accessible portions of the White Wing Scrap Yard was reported by Williams, Rodriguez, and Uziel (1990). These rates vary from background (0.01 mR/h) to 0.11 mR/h. The average surface gamma exposure rate in the block with the highest rate is 0.06 mR/h. Maximum hunter exposure conditions are defined as one who remains for 72 h (six 12-h days) in the block with the highest exposure rate. A maximally exposed hunter could have received an effective dose equivalent of between 0.7 and 8 mrem. In the block with the highest point

rate, the hunter's dose equivalent could have been 4 mrem. Correcting for differences between exposure rates at ground surface and at 1 m (body mid-height) could lower the estimated doses (based on limited information) by as much as 20%, though 10% or less is more likely (memo from F. R. O'Donnell to B. W. Lu dated September 20, 1990).

Corrective Actions: Radiological data for White Wing Scrap Yard have been evaluated. The area was designated as a Safety/Security Zone (i.e., "No Hunting" area) on the 1990 Oak Ridge Wildlife Management Area Hunting Map. The site was roped and excluded from hunting in 1989 and 1990. Chainlink fence (standard ORNL security fence) is scheduled to be installed around the perimeter of the White Wing Scrap Yard following completion of the NEPA review.

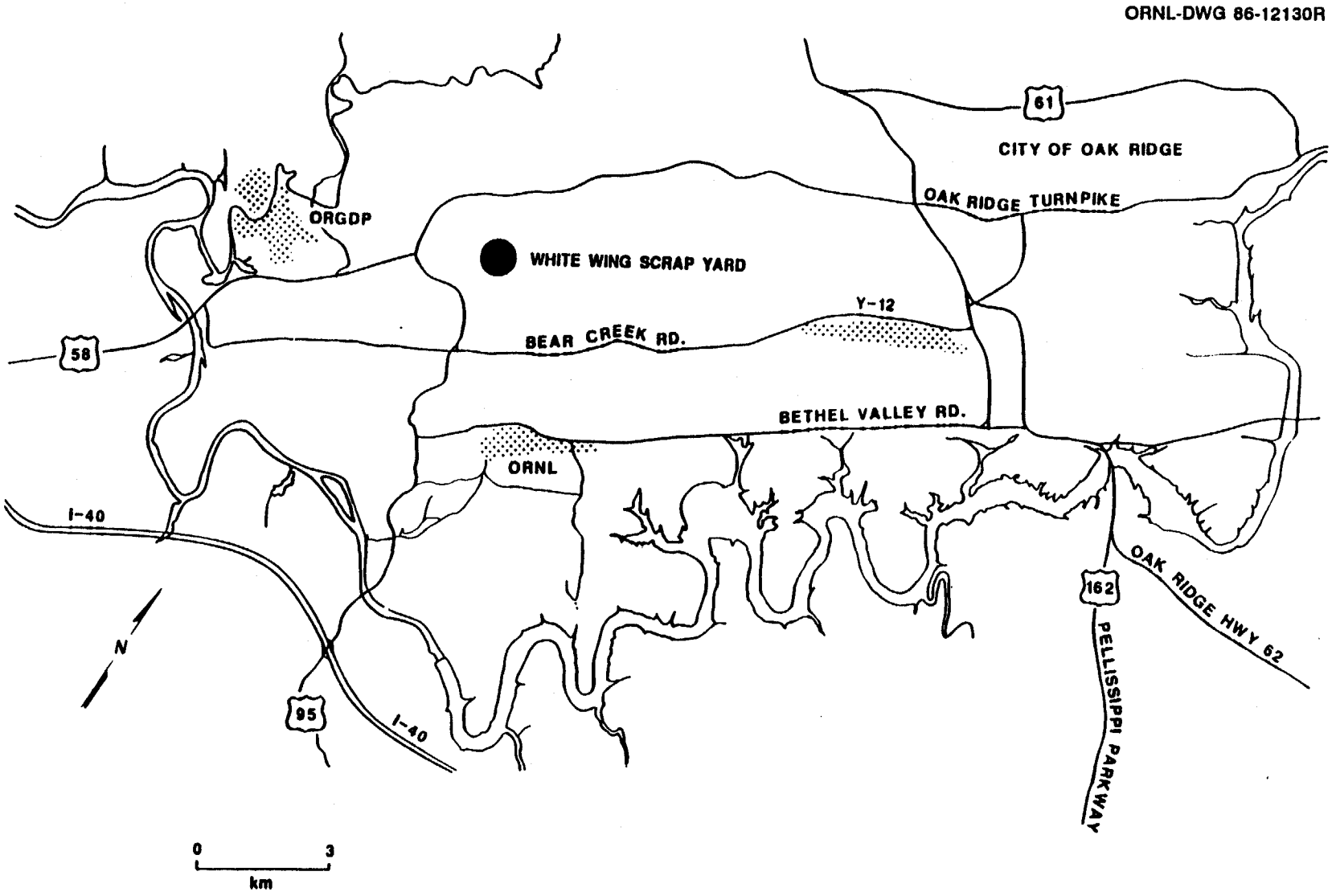


Fig. 1 Location of White Wing Scrap Yard (WAG 11).

Site ER-11 (two radioisotope treatment plots on Chestnut Ridge)

Size and Location: Both treatment plots were 1.96 ha (4.85 acres) each, a total of 3.92 ha or 19,600 square meters (9.7 acres). One plot is located 1.35 km (0.8 mile) on an azimuth of S84W from Building 2001 at Oak Ridge National Laboratory and the other 2.51 km (1.55 miles) on an azimuth of N49E, both on Chestnut Ridge. See Figure 2.

Isotope and Contamination: Each of the two study areas received applications of seeds tagged with Cs-137 and Co-60 between July 31, 1969 and September 3, 1970. The total amount of isotope in the applied seeds was approximately 5.8 mCi of Cs-137 (half-life 30 years) and 49.7 mCi of Co-60 (half-life 5.2 years) for each plot. Field radiological surveys indicate that there may be some hot spots (1-2 mR/h) present in the plots. (Nuclear and Chemical Waste Programs, 1987).

Dose Calculations: No data are available on large areas gamma exposure rates or typical surface contamination levels so hypothetical dose calculations were made. Total quantities of radionuclides contained in the seeds was 49.7 mCi of Co-60 and 5.8 mCi of Cs-137 which were spread over two areas of 19,600 square meters each. Assuming a decay period of 20.5 years, uniform deposition over the two areas, no penetration into the soil and no other removal mechanisms, the plots would contain approximately 8.5 pCi of Co-60 and approximately 9.2 pCi of both Cs-137 and Ba-137m per square centimeter. The effective dose equivalent rate at 1.0 m above the center of a plot is estimated to be aproximately 0.003 mrem/h. Inhalation of resuspended radionuclides is another possible exposure pathway although it is doubtful that 20-year old cobalt and cesium that was attached to seeds which were eaten by fauna would still be on the ground surface. We assume a resuspension factor of 10^{-8}. Using this assumption, we can calculate airborne concentrations of approximately 8.5×10^{-8} pCi/cm^3 of Co-60 and approximately 9.2 a 10^{-8} pCi/cm^3 of both Cs-137 and Ba-137m. As discussed above, the maximally exposed hunter is defined as one who remains for 72 h (six 12-h days) in the block with the highest exposure rate. Based on these considerations, a maximally exposed hunter could have received an effective dose equivalent of approximately 0.2 mrem. Almost all of this dose is attributable to photons emanating from nuclides on the ground. About 1% is due to inhalation of resuspended radionuclides.

Corrective Actions: Radiological data for these two research plots (ER-11) on Chestnut Ridge have been evaluated. These areas were designated as Safety/Security Zones ("No Hunting" areas) on the 1990 Oak Ridge Wildlife Management Area Hunting Map. Both areas were roped and excluded from hunting during 1990. Chainlink fence (standard ORNL security fence) is scheduled to be installed around the perimeter of the ER-11 plots during FY 1992.

Fig. 2. Location of Site ER-11 (two radioisotope-treatment plots on Chestnut Ridg

Summary

Two areas on the Oak Ridge Reservation that had previously been open for deer hunting have now been excluded from hunting because of the potential for radiation exposure risk to the hunter. White Wing Scrap Yard was excluded in 1989, and ER-11 (2 radioisotope treatment plots on Chestnut Ridge) was excluded in 1990. Both sites are scheduled to have chainlink security fence installed around their perimeters. The estimated dose equivalents to an individual who may have hunted in either of these areas in prior years is minimal even under maximum exposure conditions. Dose equivalents to hypothetical individuals (based on the average exposure rate) hunting in White Wing Scrap Yard area could have been 4 mrem and in ER-11 could have been 0.2 mrem over a 6 day period. These doses are compared with doses received from other common sources in Table 1 and Table 2 for perspective. While risk to the hunter appears to be minimal, we consider it prudent to continue to exclude these sites from hunting as shown on the 1990 Oak Ridge Wildlife Management Area Hunting Map (Appendix).

Table 1. Comparison of Estimated Maximum Radiation Dose Equivalents from Hunting in Contaminated Areas (White Wing Scrap Yard or ER-11) with Doses from Other Sources.

Pathway	Location	Dose (mrem)
Hunting	White Wing Scrapyard	4 (6 12-hr days)
	ER-11	0.2 (6 12 hr days)
Where You Live (Cosmic radiation only)	At Sea Level	31/yr
	In Knoxville	33/yr
	In Denver	32/yr
What You Eat and Breathe	Food, Water, and Air (U. S. average)	24/yr
How You Live	Medical	
	One chest X-ray	10
	One lower G.I. tract X-ray	500
	Radiopharmaceutical Exam	300
	Average to U.S. Population	92
	Jet Plant Travel (2500 miles)	1
	Television viewing	0.15/hr
Where You Work	Inside Radiation Areas at ORNL	500/yr
	Inside Other Areas at ORNL	100/yr

U. S. Annual Average Dose is approximately 360 mrems. Five thousand mrem (5 rem) per year is allowed to radiation workers. One mrem per year is equal to increasing your dietary intake 4%, or taking a 5-day vacation in the Sierra Nevada Mountains. 20-5- rem (20,000-50,000 mrem) can be dected by changes in the number of blood cells.

Source: ORNL Radiation Worker Training Program, 1990.

Table 2. Annual Average Effective Dose Equivalents from Various Sources In the United States.

Source	Annual Average Effective Dose Equivalent (mrem
Natural souces	
Radon	200
Other	100
Occupational	0.9
Nuclear Fuel Cycle	0.05
Consumer products (excluding tobacco)	5-13
Miscellaneous environmental	0.06
Medical	
Diagnostic X-rays	39
Nuclear medicine	14
Total rounded	360

Source: National Council on Radiation Protection and Measurements, 1987.

References

ORNL Radiation Worker Training Program. 1990. Environmental and Health Protection Division, ORNL.

National Council on Radiation Protection and Measurements. 1987. Ionizing Radiation Exposure of the Population of the United States. NCRP Report 93.

Nuclear and Chemical Waste Programs. 1987. RCRA Facilities Assessment (RFA)-Oak Ridge National Laboratory. ORNL/RAP-12/V1.

Williams, J. K., R. E. Rodriguez, and M. S. Uziel. 1990. Surface Radiological Investigations at White Wing Scrap Yard. ORNL/ER/INT-1. Internal Use Only.

Appendix

memoes
1990 Deer Hunting Map

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

June 6, 1990

Bonnie Lu

Evaluation of Areas Open for Deer Hunting

A review of the 1989 deer hunting map you sent as an attachment to your June 4, 1990, letter indicates no known contaminated or potentially contaminated areas in the hunting zones around the Y-12 Plant.

Please call me if you have any questions.

Sara H. Welch

Sara H. Welch, 9115, MS-8219 (6-5706)

SHW:jc

cc: J. W. Evans
J. C. Haymore
P. D. Parr
J. G. Rogers
D. W. Swindle
F-ER Doc. Mgt. Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

June 12, 1990

Bonne Lu

Evaluation of Areas Open for Deer Hunting

As requested by your letter dated June 4, 1990, I have reviewed the K-25 areas that are open for deer hunting on the Oak Ridge Reservation. I find that no further areas need to be restricted as shown on the 1989 Deer Hunting Map.

If you have any questions, please contact me at 4-9352.

J. L. Haymore

J. L. Haymore, K-1401, MS 7384, ORGDP (4-9352)

JLH:rbs

cc: File—JLH—NoRC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

September 20, 1990

Bonnie B. Lu, MS-6036, 1505, ORNL

Potential Radiation Doses to Hunters at the White Wing Scrap Yard

Reference: J. K. Williams, R. E. Rodriguez, and M. S. Uziel, Surface Radiological Investigations at White Wing Scrap Yard (Internal Use Only), ORNL/ER/INT-1 (June 1990).

Per your request, we have attempted to characterize potential radiation doses to hunters who might have hunted at the White Wing Scrap Yard (WWSY). This effort is complicated by the nature of the contamination at the site and by the lack of documented hunter exposure conditions.

The reference indicates that most of the radioactive contaminants are fixed (not likely to become airborne) in well-defined locations (hot spots). Ground-surface gamma exposure rates at the hot spots range from just above background (~0.01 mR/h) to a maximum of 12 mR/h (at one location). Use of the hot-spot exposure rates in estimating hunter doses is not recommended because the exposure rates fall off rapidly with distance (including height above ground) from the spot. Alternatively, the reference provides ranges of typical ground-surface gamma exposure rates over defined blocks (100-ft x 100-ft square areas) in accessible portions of the WWSY. These rates vary from background (0.01 mR/h) to 0.11 mR/h (over a few areas). The average surface gamma exposure rate in the block with the highest rate is 0.06 mR/h.

Defining hunter exposure conditions really is not possible. Therefore, as agreed in our meeting with Jim Evans, we define the maximally exposed hunter to be one who remains for 72 h (six 12-h days) in the block with the highest exposure rate. I doubt seriously that a hunter would stay at one location for an entire day, but it is possible.

Based on the above considerations, a maximally exposed hunter could have received an effective dose equivalent of between 0.7 and 8 mrem. Based on the average exposure rate, the hunter's dose equivalent could have been 4 mrem. The estimated doses have not been corrected for differences between exposure rates at ground surface and at 1 m (body mid-height). Based on limited information in the reference, such a correction might lower the estimated doses by as much as 20%. A correction of 10% or less is more likely.

F. R. O'Donnell

F. R. O'Donnell, MS-6102, 4500S, ORNL (6-2132)

FRO:es

cc: F. C. Kornegay
P. S. Rohwer
J. K. Williams
J. P. Witherspoon

October 5, 1990

Bonnie B. Lu, MS-6036, 1505, ORNL

Potential Radiation Doses to Hunters at Site ES-11

Per your request, we have attempted to characterize potential radiation doses to hunters who might have hunted on Site ES-11. This effort is complicated by lack of site contamination data and of documented hunter exposure conditions.

The information you gave me indicates the presence of some hot spots, but contains no data on large area gamma exposure rates or typical surface contamination levels. Lacking these data, we can only make calculations of hypothetical doses. The information includes the size of the two areas (4.85 acres or 19,600 m^2 each) over which the contaminated seeds were spread and the total quantities of radionuclides contained in the seeds (49.7 mCi of ^{60}Co and 5.8 mCi of ^{137}Cs). Assuming a decay period of 20.5 years, uniform deposition over the two areas, no penetration into the soil, and no other removal mechanisms, the plots would contain ~8.5 pCi of ^{60}Co and ~9.2 pCi of both ^{137}Cs and ^{137m}Ba per square centimeter. The effective dose equivalent rate at 1.0 m above the center of a plot is estimated to be ~0.003 mrem/h.

Another possible exposure pathway is inhalation of resuspended radionuclides. Although it is doubtful that 20-year old cobalt and cesium that was attached to seeds which were eaten by fauna would still be on the ground surface, we assume a resuspension factor of 10^{-8}. Using this assumption, airborne concentrations of ~8.5×10^{-8} pCi/cm^3 of ^{60}Co and ~9.2×10^{-8} pCi/cm^3 of both ^{137}Cs and ^{137m}Ba.

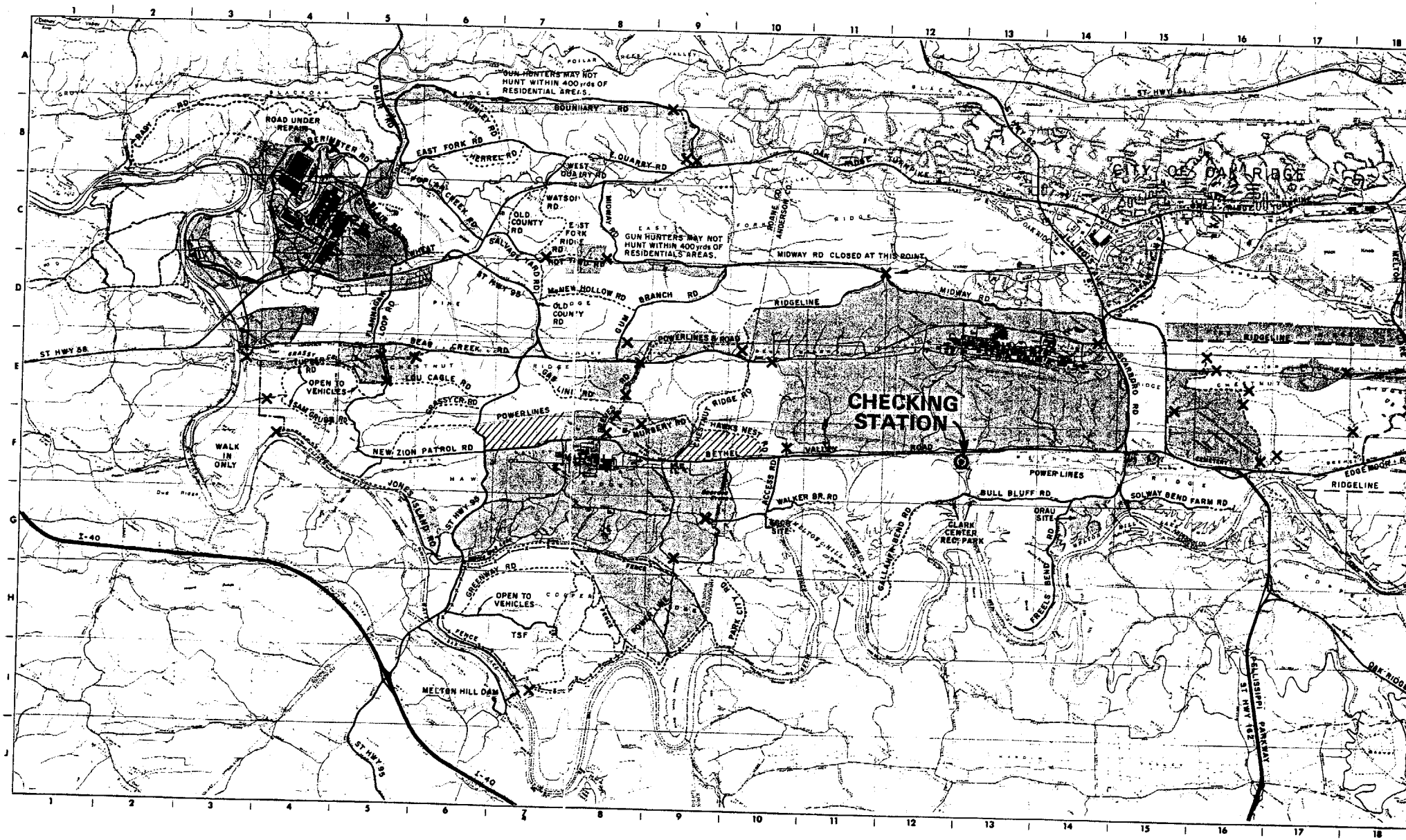
Defining hunter exposure conditions really is not possible. Therefore, as agreed in our meeting with Jim Evans, we define the maximally exposed hunter to be one who remains for 72 h (six 12-h days) in the block with the highest exposure rate. I doubt seriously that a hunter would stay at one location for an entire day, but it is possible.

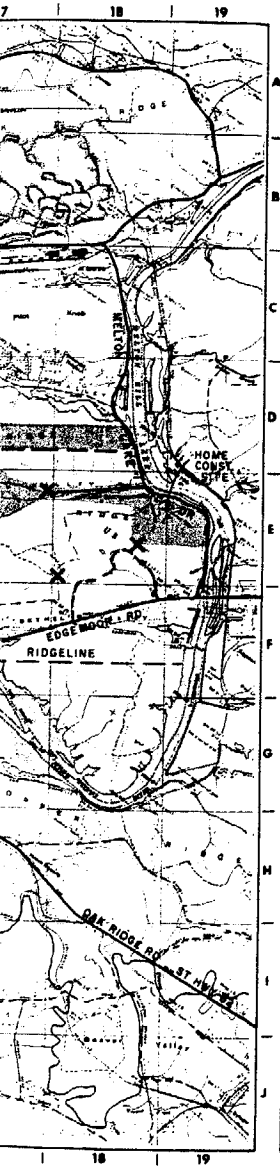
Based on the above considerations, a maximally exposed hunter could have received an effective dose equivalent of ~0.2 mrem. Almost all of this dose is attributable to photons emanating from nuclides on the ground. About 1% is due to inhalation of resuspended radionuclides.

F. R. O'Donnell

F. R. O'Donnell, MS-6102, 4500S, ORNL (6-2132)

cc: F. C. Kornegay
P. S. Rohwer
J. K. Williams
J. P. Witherspoon


CHECKING STATION
GUN HUNTERS MAY NOT HUNT WITHIN 400 yrds OF RESIDENTIAL AREAS.
ROAD UNDER REPAIR
MIDWAY RD CLOSED AT THIS POINT
OPEN TO VEHICLES
WALK IN ONLY
OPEN TO VEHICLES
MELTON HILL DAM
CLARK CENTER REC. PARK
CITY OF OAK RIDGE
BOUNDARY RD
EAST FORK RD
HERREL RD
WATSON RD
OLD COUNTY RD
MOSSY HOLLOW RD
BRANCH RD
RIDGELINE
POWERLINES & ROAD
BEAR CREEK RD
LOU EAGLE RD
SAM GRUBB RD
NEW ZION PATROL RD
POWERLINES
NORBERRY RD
HAWKS NEST
BETHEL
VALLEY ROAD
ACCESS RD
WALKER BR. RD
BULL BLUFF RD
SOLWAY BEND FARM RD
GALLAHER BEND RD
FREELS BEND RD
GREENWAY RD
TSF
POWERLINE
PARK CITY RD
JONES ISLAND RD
ST HWY 95
I-40
ST HWY 58
ST HWY 62
MISSISSIPPI PARKWAY
OAK RIDGE TURNPIKE
SCARBORO RD
EDGE WOOD DR
RIDGELINE



Resource Management Plan

For The:

U.S. DEPARTMENT OF ENERGY

OAK RIDGE RESERVATION

Prepared By:

MARTIN MARIETTA ENERGY SYSTEMS, INC.

DOE/TWRA WILDLIFE MANAGEMENT AREA

LEGEND:

- OPEN (SHOTGUN/MUZZLELOADER/ARCHERY) (OCT. 20-21 AND NOV.10-11 AND DEC. 8-9)
- OPEN/ARCHERY ONLY (OCT. 20-21) SEPARATE PERMIT REQUIRED TSF/PARK CITY RD.
- NONWILDLIFE MANAGEMENT AREA (NO HUNTING
- SAFETY ZONE/SECURITY ZONE (NO HUNTING)*
- ARCHERY EQUIPMENT ONLY
- X ROAD CLOSED-NO VEHICLES BEYOND THIS POIN

*FOR INSTRUCTIONS SEE BACK OF MAP

CAUTION: HUNTERS ARE ADVISED NOT TO SHOOT FROM OR ACROSS ANY ROAD. IT IS AGAINST THE LAW AND IT IS VERY DANGEROUS BECAUSE OF THE HIGH VOLUME OF PEDESTRAIN, BICYCLE, AND VEHICULAR TRAFFIC IN THE OAK RIDGE AREA. GUN HUNTERS MAY NOT HUNT WITHIN 400 yrds OF RESIDENTIAL AREAS.

kilometers 0 1 2 3

0 1 2 miles

NORTH TRUE GRID

1990 OAK RIDGE WILDLIFE MANAGEMENT AREA HUNTING MAP

The way you conduct yourself on this hunt will help ensure the continued operation of this management area. The TWRA expects strict compliance with all statewide and WMA laws, rules, and regulations. Hunters must adhere to all posted signs, and may not enter any NO HUNTING - SAFETY ZONE, bypass locked gates or barricades, or climb or disturb any fences. It is prohibited by Federal law to remove any material (equipment, timber, firewood, scrap metal, etc.) from this reservation. This is a Federal Security Area and failure to comply with all regulations can result in strict prosecution.

Each deer taken on the Oak Ridge WMA must be monitored for radiation contamination at the checking station. The TWRA and DOE request that each successful hunter bring the liver of the deer to the checking station for monitoring purposes. Please mark the location where the deer was taken on this map. The deer should be field dressed before it is brought to the checking station, and it should be brought in as soon as possible to avoid long waiting lines.

During the 1985 hunts, 7 deer out of 926 were withheld due to radiation contamination. In 1986, 29 of 660 were withheld. In 1987, 30 out of 530 deer were withheld. In 1988, 13 out of 507 were withheld. In 1989, 21 out of 440 were withheld.

1. Scouting will be permitted from sunrise to sunset on 10/13/90 for the 10/20-21/90 permit holders; on 11/3/90 for the 11/10-11/90 permit holders; and on 12/1/90 for the 12/8-9/90 permit holders. Only those with valid permits will be allowed to scout. No friends, relatives, colleagues, or other persons are allowed to scout. Permit holders are prohibited from the area except for scouting and hunting days. TWRA personnel will be at the checking station on the scouting days to answer questions.
2. A separate hunter quota of 350 has been established for the Tower Shielding and Park City Road areas. Only those archery hunters with a Tower Shielding/Park City Road Permit will be allowed into these two (2) areas. Hunters are asked to leave the TSF/PCR areas as soon as possible after sunset so the area can be secured and gates closed. Cameras, tape recorders, and walkie-talkies are not allowed in the Tower Shielding Facility.
3. If a deer is hit and crosses into a safety zone area, you must contact a TWRA officer to accompany you to retrieve it.
4. As with all WMAs, hunters may not enter the area prior to one (1) hour before sunrise and must be out one (1) hour after sunset. Side road gates will be opened by 6 a.m. and closed by 8 p.m. on hunting and scouting days. Signs will be posted on roads open to hunters.
5. Driving off roads into woods, fields, pastures, or on foot trails or utility rights-of-way is prohibited for ALL motorized vehicles. No camping is allowed on the areas and no target ranges are open to hunters. Coyotes and bobcats may not be taken on the Oak Ridge WMA. No access by boat.
6. The University of Tennessee Oak Ridge Forestry Experiment Station is an active forestry research area with research projects in progress; therefore, hunter and/or vehicle access to this property is subject to restrictions if over-crowding or property damage occurs during the hunt.
7. Plant Site and Security Zones are NO TRESPASSING AREAS by order of the United States Department of Energy. Absolutely no through traffic is allowed on Bear Creek Road adjacent to the Oak Ridge Y-12 facility. Possession of firearms, archery equipment, or other contraband in the Y-12 area is prohibited and will be strictly enforced. No through traffic is allowed on any roads in the plant unless otherwise indicated by signs. The unauthorized entry into any facility, installation, or real property subject to the jurisdiction, administration, or in the custody of the Department of Energy, which has been designated as subject to the provisions contained in 10 CFR Pt. 860 of the rules and regulations of the Department of Energy, is prohibited, and the unauthorized carrying, transporting, or otherwise introducing or causing to be introduced, any dangerous weapon, explosive, or other dangerous instrument or material likely to produce substantial injury or damage to persons of property, into or upon such facility, installation, or real property is prohibited. Whoever willfully violates the aforesaid regulation shall, upon conviction thereof, be punishable by a fine of not more than $1,000. Whoever willfully violates this regulation with respect to any facility, installation, or real property enclosed by a fence, wall, floor, roof, or other structural barrier, shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine not to exceed $5,000 or imprisonment for not more than 1 year, or both. By authority of section 229 of the Atomic Energy Act of 1954, as amended, and 10 CFR Pt. 860 of the rules and regulations of the Department of Energy, this facility, installation, or real property has been designated as subject to these regulations by the United States Department of Energy.
8. Emergency help is available at three (3) plant sites or by calling 911 on any telephone in the Oak Ridge area. If injuries or other emergencies occur, contact any wildlife officer, security guard, or come to checking station.
9. Caution: Hunters using archery equipment during the <u>11/10-11/90</u> and <u>12/8-9/90 Archery, Muzzleloader/Shotgun</u> hunts must wear, on the upper portion of their body and head, a minimum of 500 square inches of daylight fluorescent orange, visible front and back.
10. No litter or sewage shall be deposited in the area. Please remove all food and beverage containers as you leave the hunting area. If you find any areas that need our attention, please report them to the TWRA deer checking station.

ChemRisk Document Request Transmittal Form

(This section to be completed by ChemRisk)

S. Sandberg / _____
Name Division is requested to provide the following document

Address _____

Date of Request 12/10 Expected receipt of document 12/21

Title of requested document Report Evaluating Areas on ORR Open for Hunting

Document Number M000S1

Access Number of Document _____ Date of Document 9/26/91

(This section to be completed by Derivative Classifier)

Derivative Classifier T.R.G. Jordan Phone 4 1645

Date document transmitted to Dr. Quist 1/15/93

Date release received from Dr. Quist OK 082 1/21/91

PUBLIC RELEASE STAMP attached to each copy of document (YES NO)

Date document sent to reproduction _____ Expected Return _____

Delivered to DRC by _____ Date _____

(This section to be completed by DRC)

Received by DRC _____ Date _____

Processed _____

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1993 FEB -3 PM 5:56

OAK RIDGE K-25 SITE DOCUMENT RELEASE FORM

Person requesting release Jennifer Lamb (Chem Risk) 4-0745

Mailing Address K-1200 MS-7262

Rec'd K-25CO: 1/29/93
c: JLamb
File-K25CO-RC(4710)
AS Quist, 2/1/93

Date by which release is required _____ ...essing time is 5 working days.

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Document number Unnumbered / M000051 Pages 19

Document title Report Evaluating Areas on Oak Ridge Reservation Open for Hunting

Author(s) (indicate other divisions or organizations, if applicable) ME Mitchell

Document type (See Doc. Prep. Guide, Chs. 1 and 2, for definitions of document types):

☐ Formal Report ☐ Progress Report ☐ Informal R&D Report ☐ Abstract ☐ Drawing

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AUTHORS: BW LU; PD PARR; AND FR O'DONNELL

DOCUMENT TYPE: CORRESPONDENCE

DOCUMENT DATE: 06-00-91

PURPOSE OF RELEASE: HEALTH STUDY FEASIBILITY REPORT

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AUTHORS: SARA H. WELCH

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AUTHORS:

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